

Accurate Electromagnetics and Antenna Simulations using the FDTD Method

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This presentation will focus on recent developments in the finite difference time domain (FDTD) method for the solution of several electromagnetic and antenna problems. First a brief introduction of the method, its unified formulation, its capabilities, and the integration of linear and non-linear circuit elements in the electromagnetic simulation. Several examples of designing antennas, filters, and RFID tags as well as RCS computations of large targets will be demonstrated. This will be followed by the demonstration of how to examine the numerical results to accurately achieve successful simulations and how to eliminate numerical or geometry assignment errors. The speed up of the FDTD method using graphical processing gaming cards (GPUs) along with the use of different programming languages such as FORTRAN, MATLAB, CUDA, and OpenCL will be highlighted.



Atef Z. Elsherbeni is a professor at the Electrical Engineering Department at Colorado School of Mines. He started his engineering career as a Software and System Design Engineer at Automated Data System Center in Egypt in 1979. He earned a Ph.D. degree in Electrical Engineering from Manitoba University in 1987. He joined the university of Mississippi in 1987 where he was a Professor of Electrical Engineering and Associate Dean for Research. He moved to Colorado School of Mines in 2013 where he was the Dobelman Distinguished Professor and Department Head of the EECS Department. He

was one of the Associate Editors to Radio Science Journal, a past Chair of the Engineering and Physics Division of Mississippi Academy of Science, a past Chair of Educational Activity Committee for IEEE Region 3 Section, the general Chair for the 2014 APS-URSI Symposium, and the past president of ACES Society. Dr. Elsherbeni is the Editor-in-Chief for ACES Journal. He was selected as Finland Distinguished Professor, is one of the current IEEE Antennas and Propagation Society Distinguished Lecturers, is a Life Fellow member of IEEE, and a is Fellow member of ACES.